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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/585,388	07/07/2006	Akiko Uchikawa	10873.1920USWO	2992

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EXAMINER	
HUNTLEY, DANIEL CARROLL	
ART UNIT	PAPER NUMBER
3737	
MAIL DATE	DELIVERY MODE
06/03/2011	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/585,388	UCHIKAWA ET AL.	
	Examiner	Art Unit	
	DANIEL HUNTLEY	3737	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 April 2011*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 03/08/11 has been entered.

Claim Objections

Claims 1-5 are objected to because of the following informalities: Claim 1 is missing several commas, at least specifically, in lines 10 and 11, where 'data including' should be replaced with 'data, including' and 'beam to filtering' should be replaced with 'beam, to filtering'. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, the term "storage" is normally directed to a physical entity so it is unclear as to what structure is defined by such a term. Further, it is unclear as to what structure is defined

by the term "portion" in that the term is generally used to define less than all of an element but the "element" has not been defined so it is unclear as to what is referred to by 'portion' in line 15, it is unclear as to what is meant by the phrase, '... converted into scanning of a display monitor so as to display an image on the display monitor.' Further still,
the paragraph that begins 'a first spatial filter operation portion...' is confusing due to significant missing punctuation and redundancy in describing 'parallel' reception beams.

Claim 1 recites the limitations "the first storage means" in line 5, "the target reception beam" in line 20. There is insufficient antecedent basis for these limitations in the claim.

Further, claim 1 recites the limitation "the reception beam data including the reception beam data converted from parallel reception beams received in parallel from a single transmission beam" starting in line 10. There is insufficient antecedent basis for this limitation in the claim.

In claim 2, it is unclear as to whether the ultrasonic reception beam data processing portion is part of the claimed invention. Additionally, claim 2 is indefinite because it sets forth a second storage means and a second control means without first setting forth a first storage means or a first control means.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are

> such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 7,604,596 B2 (Hwang('596)) in view of US 6,679,846 B2 (Napolitano('846)), further in view of US 5,779,640 A (Holley('640)).

In re claims 1 and 2, Hwang('596) teach an ultrasonic signal processor in the field of ultrasonic diagnostics. Specifically, Hwang('596) teach a device comprising plural memory devices for storing both digital reception beam and a two-dimensional Doppler data output (col 3, lns 5-28); a control device for controlling reading and writing of data to the memory devices (col 3, lns 29-45); filters for received beams including Doppler data and associated variable filter coefficients (abstract; col 5); a display (col 3, lns 55-67). It is noted that Hwang('596) do not expressly teach a filter coefficient calculation portion. However, in the field of medical ultrasound imaging, Napolitano('846) teaches spatial filter coefficients that are determined as a function of range, elevation, and /or azimuth (col 14). The examiner further notes that Napolitano('846) discloses uses with several beam geometries, including parallel beams (col 17, lns 30-35). Hence, it would have been obvious to one of ordinary skill in the art at the time of

the invention to modify the ultrasound circuitry as disclosed by Hwang('596) with the filter coefficient calculating method as disclosed by Napolitano('846) in order to vary the performance of spatial filters according to receive beam characteristics to minimize destructive interference among the receive beams (Napolitano('846) - col 5, lns 1-10).

The examiner notes that Hwang('596) and Napolitano('846) fail to expressly teach a spatial filter operation configured to subject a plurality of reception beam data to filtering for reducing a difference in image quality between adjacent beams and further configured to filter the reception beam data converted from the target and adjacent plural reception beams thereby generating image data at a specified sampling point. Further, Hwang('596) and Napolitano('846) fail to expressly teach a filter coefficient calculating portion based on reception beam information or configured to apply the filter coefficient to the reception beam data converted from the parallel reception beam received in parallel with the target reception beam. However, in the field of ultrasound systems, Holley('640) teach spatial filtering for filtering a plurality of reception beam data for improving image quality between adjacent beams (abstract; col 2, lns 44-60) and further teach generating sampling data at a desired azimuthal coordinate (col 10, 38-57; col 8, 29-65), which the examiner interprets as being a specified sampling point. The examiner interprets the filter weighting disclosed in Holley('640) to describe 'reducing a difference in image quality between adjacent beams. Further, Holley('640) teach a processor for calculating filter coefficients based on reception beam information as well as applying those filter coefficients to the reception beam converted from target reception beam and the adjacent plural beams (col 6, lns 10, 30; col 6, lns 48-54). The examiner interprets the filtering process as disclosed in Holley('640) to include applying the filter coefficients to the reception beam data

and further interprets the filter weighting as described above to describe variable sized filter coefficients.

Hence, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the ultrasound circuitry as disclosed by Hwang('596) and the filter coefficient calculating method as disclosed by Napolitano('846) with the spatial filtering with calculated filter coefficients as disclosed by Holley('640) in order to vary the performance of spatial filters according to receive beam characteristics to minimize destructive interference among the receive beams.

In re claims 3-5, Hwang('596), Napolitano('846), and Holley('640) teach the invention as described above, and further, Napolitano('846) teach varying the filtering coefficients in accordance with a varying range, azimuth, or elevation value (col 14, lns 23-37) as well as varying transmit focal position and elevation angles (col 12, lns 18-42). The examiner interprets the range dimension to represent a receive depth. Further, Holley('640) teach the use of receiving depth, angle of the receive beam, and focal position of the transmission beam to control the filter coefficient calculation (col 3, lns 50-60; col 4, lns 25-67).

Response to Arguments

Applicant's arguments with respect to claims 1-5 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANIEL HUNTLEY whose telephone number is (571)270-1217. The examiner can normally be reached on Monday through Friday, 7:30-4, alternating Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Casler can be reached on 571-272-4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ruth S Smith/
Primary Examiner, Art Unit 3737

/DANIEL HUNTLEY/
Examiner, Art Unit 3737